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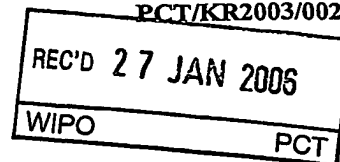
PCT/KR2003/002318

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)



(PCT Article 36 and Rule 70)



Applicant's or agent's file reference PCT03-069	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/KR2003/002318	International filing date(day/month/year) 31 OCTOBER 2003 (31.10.2003)	Priority date (day/month/year)
International Patent Classification (IPC) or national classification and IPC C12N 9/74(2006.01)i		
Applicant BIOBUD CO., LTD. et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____ containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 31 MAY 2005 (31.05.2005)	Date of completion of this report 16 JANUARY 2006 (16.01.2006)
Name and mailing address of the IPEA/KR  Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer CHO, YOUNG GYUN Telephone No. 82-42-481-8132 

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/KR2003/002318

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☒ This report is based on translations from the original language into the following language English which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☒ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
 - ☒ the international application as originally filed/furnished
 - ☐ the description:
 - pages _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ the claims:
 - pages _____ as originally filed/furnished
 - pages* _____ as amended (together with any statement) under Article 19
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☐ the drawings:
 - pages _____ as originally filed/furnished
 - pages* _____ received by this Authority on _____
 - pages* _____ received by this Authority on _____
 - ☒ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages _____
 - ☐ the claims, Nos. _____
 - ☐ the drawings, sheets _____
 - ☐ the sequence listing (*specify*): _____
 - ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	2, 5, 6	YES
	Claims	1, 3, 4	NO
Inventive step (IS)	Claims	None	YES
	Claims	2, 5, 6	NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

The following documents have been considered for the purpose of this report:

D1: CN 1370833 (DALIAN SCIENCE & ENGINEERING U) 25 SEPTEMBER 2002

D2: J. Biol. Chem., Vol. 262(7), pp. 3132-3135 (1987)

D3: Sheng Wu Gong Cheng Xue Bao, Vol. 18(5) pp. 593-596 (2002)

I. Novelty

Claims 1, 3 and 4 relate to an yeast expression vector pPIC-rBAT comprising recombinant thrombin-like enzyme, an yeast (*Pichia pastoris*) GS115 transformed with said expression vector, and a preparation method of thrombin-like enzyme using said transformed yeast.

D1 discloses a cDNA sequence and a corresponding amino acid sequence of venom batroxobin, a thrombin-like enzyme from Gloydius shendaoensis; *Pichia pastoris* secretion type expression vector pPIC9K containing said batroxobin gene; *Pichia pastoris* GS115 containing said expression vector; and a method for manufacturing recombinant batroxobin using said transformed yeast. The subject matter of claims 1, 3 and 4 is not distinguishable from the disclosure of D1.

Therefore, claims 1, 3 and 4 in the present invention are not considered to be novel under PCT Article 33(2).

II. Inventive Step

Claim 2 relates to the yeast expression vector containing the batroxobin protein listed in SEQ ID NO: 1.

D2 discloses the amino acid sequence of batroxobin, a thrombin-like snake venom enzyme, having 231 amino acids identical to SEQ ID NO: 1 in the present invention. The claimed invention discloses a simple expression vector constructed by inserting the batroxobin gene known in D2 into the yeast expression vector known in D1. This is obvious to a person skilled in the art. Therefore, claim 2 lacks an inventive step as being obvious in view of D1 and D2.

(Continued on Supplemental Sheet.)

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Supplemental Box Relating to Sequence Listing

Continuation of Box No. I, item 2:

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this report was established on the basis of:

a. type of material



a sequence listing



table(s) related to the sequence listing

b. format of material



on paper



in electronic form

c. time of filing/furnishing



contained in the international application as filed



filed together with the international application in electronic form



furnished subsequently to this Authority for the purposes of search and/or examination



received by this Authority as an amendment* on _____

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed of furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of:

Box No. V

Claims 5 and 6 relate to a preparation method of thrombin-like enzyme, by incubating the transformed yeast and inducing the recombinant enzyme with methanol; and a preparation method of recombinant thrombin-like enzyme, by obtaining active fraction of recombinant enzyme using hydrophobic chromatography and purifying the recombinant enzyme using affinity chromatography.

D1 discloses a *Pichia pastoris* GS115 transformed with the yeast expression vector containing batroxobin gene. D3 discloses a method for producing a recombinant protein by culturing the *Pichia pastoris* GS115 transformed with a plasmid pPIC9K13; and a method for purifying the recombinant protein by using a chromatography. Therefore, it is obvious to a person skilled in the art to design and constitute the method for preparing and purifying the recombinant thrombin-like enzyme of this invention from the disclosure of D1 and D3. In addition, the resulting effect of the claimed invention can be expected by a person skilled in the art.

Therefore, claims 1, 5 and 6 in this invention lack an inventive step under PCT Article 33(3).

III. Industrial Applicability

The subject matter of claims 1-6 is considered to be industrially applicable under the PCT Article 33(4). //